

CLAIMS

1. A method for curing an adhesive die attach material in a board-on-chip (BOC) and lead-on-chip (LOC) semiconductor device package assembly having a semiconductor die adhered to a substrate by the adhesive die attach material, the method comprising:

applying uniform pressure to the semiconductor package assembly; and

applying heat to the semiconductor package assembly in order to cure the adhesive die attach material.

2. The method of claim 1 wherein applying uniform pressure and applying heat occur simultaneously.

3. The method of claim 1 wherein the pressure applied is between about 30 and 250 pounds per square inch.

4. The method of claim 1 wherein the pressure applied is between about 115 and 135 pounds per square inch.

5. The method of claim 1 wherein the pressure applied is about 125 pounds per square inch.

6. The method of claim 1 wherein the heat applied has a temperature between about 100 °C and 200 °C.

7. The method of claim 1 wherein the heat applied has a temperature between about 140 °C and 175 °C.

8. The method of claim 1 wherein the heat applied has a temperature about 165 °C.

9. The method of claim 1 wherein the pressure and heat are applied for a length of time between 30 minutes and 4 hours.
10. The method of claim 1 wherein the pressure and heat are applied for a length of time between 50 and 90 minutes.
11. The method of claim 1 wherein the pressure and heat are applied for approximately 70 minutes.
12. The method of claim 1 wherein the pressure applied is approximately 125 pounds per square inch and the heat applied is approximately 165 °C, both simultaneously for approximately 70 minutes.
13. A method of attaching a semiconductor die to a substrate in a board-on-chip (BOC) and lead-on-chip (LOC) semiconductor device package assembly, the method comprising:
- adhering the semiconductor die to the substrate using an adhesive die attach material disposed between a surface of the die and substrate in order to form a package assembly; and
 - reducing voids in a die attach bondline defined by the interface between the adhesive die attach material and the surface of the die by applying a process comprising:
 - uniformly compressing the semiconductor die to the substrate;
 - and
 - curing the adhesive die attach material by applying heat to the package assembly.
14. The method of claim 13 wherein uniformly compressing the semiconductor die to the substrate comprises applying a uniform pressure to the package assembly.

15. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously.

16. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously for a length of time between 30 minutes and 4 hours.

17. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously for a length of time between 50 and 90 minutes.

18. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the pressure applied is between about 30 and 250 pounds per square inch.

19. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the pressure applied is between about 100 and 150 pounds per square inch.

20. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the applied heat has a temperature between about 100 °C and 200 °C.

21. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the applied heat has a temperature between about 140 °C and 175 °C.

22. The method of claim 14 wherein the uniform pressure and heat are applied to the package assembly simultaneously for about 70 minutes, the pressure

applied is about 125 pounds per square inch, and the heat applied has a temperature of about 165 °C.

23. The method of claim 13, further comprising electrically coupling the semiconductor die to conductive traces formed on the surface of the substrate through conductive bond wires.

24. A board-on-chip (BOC) and lead-on-chip (LOC) semiconductor device package assembly having a semiconductor die and a substrate, and being constructed from a process comprising:

attaching the semiconductor die to the substrate using an adhesive die attach material disposed between the semiconductor die and the substrate; and

forming a die attach bondline defined by the interface between the adhesive die attach material and the semiconductor die by applying uniform pressure to the semiconductor device package assembly, and applying heat to the semiconductor device package assembly in order to cure the adhesive die attach material.

25. The semiconductor device package assembly of claim 24, further comprising electrically coupling the semiconductor die to conductive traces formed on the surface of the substrate through conductive bond wires.

26. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously.

27. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously for a length of time between 30 minutes and 4 hours.

28. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously for a length of time between 50 and 90 minutes.

29. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the pressure applied is between about 30 and 250 pounds per square inch.

30. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the pressure applied is between about 100 and 150 pounds per square inch.

31. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the applied heat has a temperature between about 100 °C and 200 °C.

32. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the applied heat has a temperature between about 140 °C and 175 °C.

33. The semiconductor device package assembly of claim 24 wherein the uniform pressure and heat are applied to the package assembly simultaneously for about 70 minutes, the pressure applied is about 125 pounds per square inch, and the heat applied has a temperature of about 165 °C.

34. A board-on-chip (BOC) and lead-on-chip (LOC) semiconductor device package assembly, comprising:

a semiconductor die;

a substrate to which the semiconductor die is attached; and

adhesive die attach material disposed between the semiconductor die and the substrate to adhere the die to the substrate, the adhesive die attach material cured by a process comprising applying uniform pressure and applying heat to the semiconductor device package assembly.

35. The semiconductor device package assembly of claim 34 wherein the adhesive die attach material comprises a tri-layer die attach tape.

36. The semiconductor device package assembly of claim 34, further comprising a lead frame disposed between the semiconductor die and the substrate.

37. The semiconductor device package assembly of claim 34 wherein the semiconductor die is electrically coupled to conductive traces formed on the surface of the substrate through conductive bond wires.

38. The semiconductor device package assembly of claim 34 wherein the uniform pressure and heat are applied to the package assembly simultaneously for a length of time between 30 minutes and 4 hours.

39. The semiconductor device package assembly of claim 34 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the pressure applied is between about 30 and 250 pounds per square inch.

40. The semiconductor device package assembly of claim 34 wherein the uniform pressure and heat are applied to the package assembly simultaneously, and the applied heat has a temperature between about 100 °C and 200 °C.

41. The semiconductor device package assembly of claim 34 wherein the uniform pressure and heat are applied to the package assembly simultaneously for

about 70 minutes, the pressure applied is about 125 pounds per square inch, and the heat applied has a temperature of about 165 °C.